

Identifying Hotspots of HIV Infection in India

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DOI: <https://doi.org/10.52403/ijhsr.20230616>

ABSTRACT

The study aims to identify the states & districts having higher HIV incidence rates. The data on HIV/AIDS in the Health Management Information System (HMIS) web portal has been used for the study. The result suggests the incidence of HIV at the Indian level was found to be 0.26 percent. At the sub-national level, Daman & Diu (2.4%) followed by Telangana (1.3%), Uttar Pradesh (0.9%), Bihar (0.6%), Gujarat (0.6%), and Andaman & Nicobar Islands (0.5%) have higher incidence rate than the national average. Subsequently, districts from several states like Uttar Pradesh, Telangana, Gujarat, Bihar, Nagaland, etc., show a higher incidence rate than the national level. Particularly, Medak (17.8%) and Chhotaudepur district (10.3%) of Gujarat; Nalanda (9.7%) of Bihar; Peddapalli (6.9%) of Telangana; Etah (6.4%) and Mirzapur (5.5%) from Uttar Pradesh. The study concludes that there is a need to address the commoving and increasing trend in HIV incidence in these states as they are densely populated with poor health services and less socio-economic developed States. So, the information, education, and communications programs on HIV should be strengthened in the states having a higher number of persons with HIV. The district-level planning and monitoring of the programs may help to arrest the rising incidence in the socio-economically poor states of India before it's too late.

Keywords: HIV/AIDS Incidence, HMIS, SDG

INTRODUCTION

HIV/AIDS epidemic continues to be a major public health issue globally and it was estimated that worldwide 38 million people were living with the infection by 2019(1). The HIV infection is a manageable chronic health condition with providing access to effective HIV prevention (focusing on all prevention measures), diagnosis, treatments, and care; which can contribute to extending the life expectancy and healthy life for the People Living with HIV (PLHIV). The shreds of evidence from the international efforts in response to control HIV infection show that the coverage of services for PLHIV is increasing. For instance, 68 percent of adults and 85 percent of pregnant and breastfeeding women with HIV infection are receiving lifelong

Antiretroviral Therapy (ART). Globally, around 29 million people living with HIV were receiving ART in 2021. Whereas, the global average was 75% in 2021 and only 52% of children (0-14 years old) were receiving ART at the end of 2021. However, more efforts are needed to scale up treatment for children and adolescents (2). A recent report by UNAIDS revealed that New HIV infections have been reduced by 54% since 1996 and subsequently deaths related to AIDS reduced by 68% since the peak in 2004 and by 52% since 2010(2). However, the situation in low-income countries is not promising, and need more sustainable policies and programs.

Being a signatory to the UN, India is committed to following Sustainable Development Goal 3.3 to "END of AIDS"

epidemic as a public health threat by the year 2030 (3). Though, nationally, annual new HIV infections have declined by 37 percent between 2010 and 2019; and mortality is also declined by 66 percent but the results are not promising when considering the complete eradication of HIV/AIDS (1). To target the eradication of HIV/AIDS government need to focus on the hot spots and regions having a higher incidence of HIV in India. The empirical evidence is most prominent to frame the policies and programs that can achieve the targeted goals of SDGs 3.3. In this context, although the National AIDS Control Organization, Government of India, provides vital estimations for HIV at the sub-national level in India, however to our knowledge the district-level incidence rate of HIV is not available in India (4,5). Therefore, it is important to address this issue with every possible data source in India. In this line, the present study aims to identify the districts having higher incidence rates of HIV using the Health Management Information System (HMIS) data which is the public health service statistics. The identification of districts and states that have higher cases of HIV/AIDS may be targeted for the necessary policy alteration in achieving the SDGs in India. The available data on HIV/AIDS in the Health Management Information System (HMIS) web portal data (2018-19) has been used for the study. The HMIS data source is an established data source for the reproductive, maternal, and child health indicators, as communicable and non-communicable diseases data which also covered a few elements associated with HIV/AIDS including; 1) Male HIV - Number Tested at the government health facility and 2) Female Non-ANC HIV - Number Tested respective health facility. 3) Number of pregnant women screened for HIV. 4) Out of the above number screened positive, the number confirmed with HIV/AIDS at Integrated Counselling and Testing Centre (ICTC).

In India, HIV counselling and testing services have been continuing since 1997. A total of 20,756 ICTCs have been functioning in India till 2016, they are mainly integrated with the public health facilities in India (6). These Centres conduct HIV tests, provide counselling on the mode of HIV transmission, promote behavioral changes to minimize the risk, link people who are HIV positive with the HIV care center, and provide treatment services. The ICTCs provide a “Person Identification Digit” (PID) number which minimizes the probability of duplication in reporting of cases at different places (7). we have calculated the HIV incidence rate at the sub-national and district level for India using the HMIS data. Further, the study identifies districts having a higher number of HIV/AIDS cases in India for policy implementation.

FINDINGS

Results show that the HIV incidence rate is found to be 0.26 percent at the national level. The study further highlighted that all together, six states in India have a higher incidence rate of HIV than the national average. The Daman & Diu (2.38%) have the highest HIV incident rate followed by Telangana (1.31%), Uttar Pradesh (0.94%), Bihar (0.61%), Gujarat (0.55%), and Andaman & Nicobar Islands (0.47%) (Table 1 and Map 1). Jammu & Kashmir, followed by Lakshadweep, Puducherry, Dadra & Nagar Haveli, Chandigarh, Maharashtra, and Himachal Pradesh have the lowest HIV incidence rate in India.

The result of district-level analysis presents that a total of 32 districts in Uttar Pradesh have a higher incidence rate of HIV than the national average, with Sitapur & Etah at around 6.5%, Mirzapur (5.5%) followed by Banda & Mathur at around 4.5% having highest incidence rate in the state. Similarly, Telangana (18 districts) i.e. Medak (17.8%), Pedappalli (6.9%), flowed by Khammam (3.9%) has the highest incidence rate in the state, Gujarat (12 districts) Chhotaudepur (10.2%) followed by The Dangs (3.4%),

Bihar (10 districts) i.e. Nalanda(9.7%) followed by East Champaran(3.5%), Nagaland (7 districts), Karnataka and Madhya Pradesh (6 districts respectively) and Meghalaya (4 districts) have higher incidence rate (Map 2). District Medak (17.80%) of Telangana has the highest

incidence rate of HIV in India followed by Chhotaudepur (10.28%) of Gujarat, Nalanda (9.68%) of Bihar; Peddapalli (6.93%) of Telangana; Sitapur (6.53%), Etah (6.43%), Mirzapur (5.54%), Banda (4.49%), Mathura (4.39%) and Chandauli (4.09%) of Uttar Pradesh.

Table 1: Sub-national level HIV/AIDS incidence rate in India during the year 2018-19

State and Union Territories	HMIS Incidence Rate (%)	HMIS Total Tested
Andhra Pradesh	0.08	1889522
Arunachal Pradesh	0.10	37900
Assam	0.14	601180
Bihar	0.61	2134174
Chhattisgarh	0.05	926242
Goa	0.01	64166
Gujarat	0.55	2318448
Haryana	0.09	928347
Himachal Pradesh	0.01	301203
Jammu & Kashmir	0.00	365393
Jharkhand	0.19	982966
Karnataka	0.17	3437678
Kerala	0.17	1141148
Madhya Pradesh	0.11	1955459
Maharashtra	0.02	4439593
Manipur	0.03	88533
Meghalaya	0.15	108063
Mizoram	0.22	57107
Nagaland	0.21	82031
Odisha	0.08	1216446
Punjab	0.04	1000203
Rajasthan	0.05	2411910
Sikkim	0.01	17614
Tamil Nadu	0.01	3999323
Telangana	1.31	1290620
Tripura	0.03	133330
Uttar Pradesh	0.94	4020903
Uttarakhand	0.14	222864
West Bengal	0.07	2565511
Union Territories		
Andaman & Nicobar Islands	0.47	27065
Chandigarh	0.02	120403
Dadra & Nagar Haveli	0.01	40064
Daman & Diu	2.38	13367
Delhi	0.16	1015037
Lakshadweep	0.00	4560
Puducherry	0.01	109527
INDIA	0.26	40067900

DISCUSSION AND POLICY IMPLICATIONS

To achieve the SDGs -3.3 of “END of AIDS”, a country like India with a huge population needs a micro-level evidence-based strategy to eradicate the epidemic. The dearth of empirical data at the district level in India focused on targeted areas for policy and program implementation. In this context, our study is an attempt to provide empirical evidence on HIV in India at the district level using the large data set that is

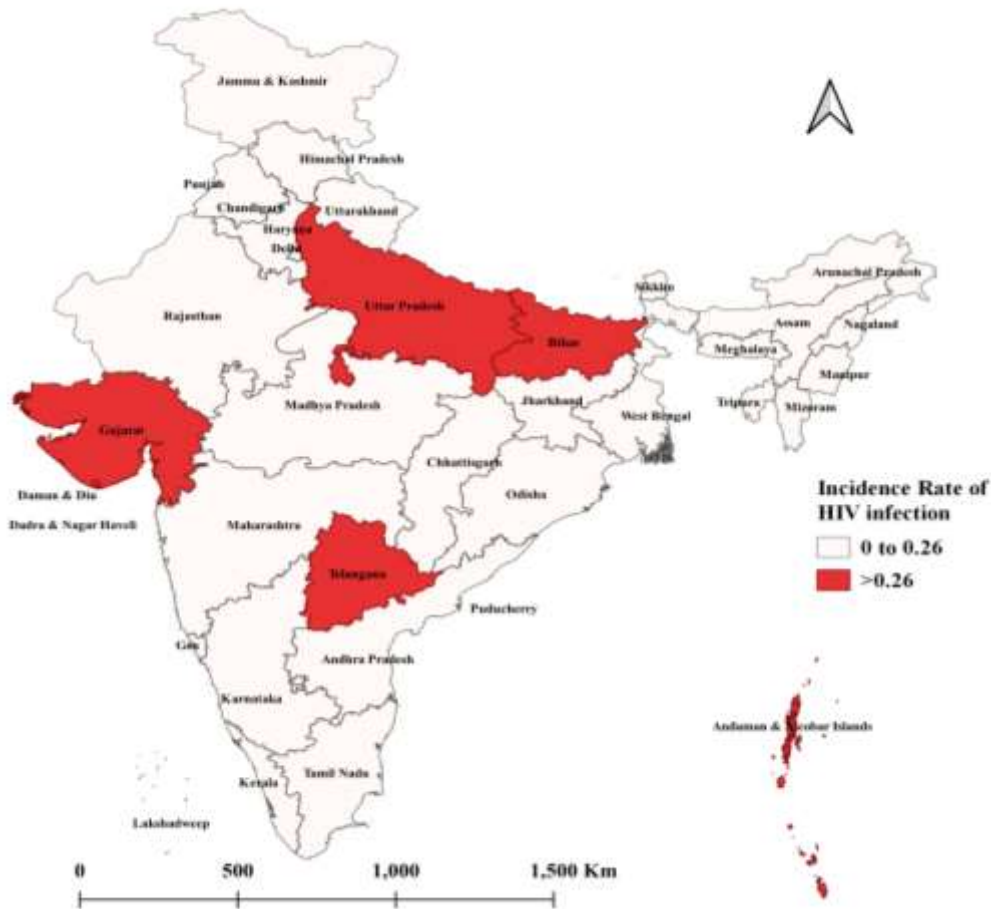
found to be promising for policies and programs.

The findings summarize that there is a paradigm shift in the incidence rate of HIV in India. The states with poor socioeconomic status and health indicators are in an alarming situation. The incidence of HIV at the Indian level was found to be 0.26 percent. At the sub-national level, Daman & Diu (2.38%) followed by Telangana (1.31%), Uttar Pradesh (0.94%), Bihar (0.61%), Gujarat (0.55%), and Andaman & Nicobar Islands (0.47%) have

higher incidence rate than the national average. Subsequently, 32 districts in Uttar Pradesh, Telangana (18 districts), Gujarat (12 districts), Bihar (10 districts), Nagaland (7 districts), Karnataka and Madhya Pradesh (6 districts respectively) and Meghalaya (4 districts) have higher incidence rate than the national level. Particularly, Medak district

(17.80%) of Telangana has the highest incidence rate in India followed by Chhotaudepur (10.28%) of Gujarat, Nalanda (9.68%) of Bihar; Peddapalli (6.93%) of Telangana; Sitapur (6.53%), Etah (6.43%), Mirzapur (5.54%), Banda (4.49%), Mathura (4.39%) and Chandauli (4.09%) of Uttar Pradesh.

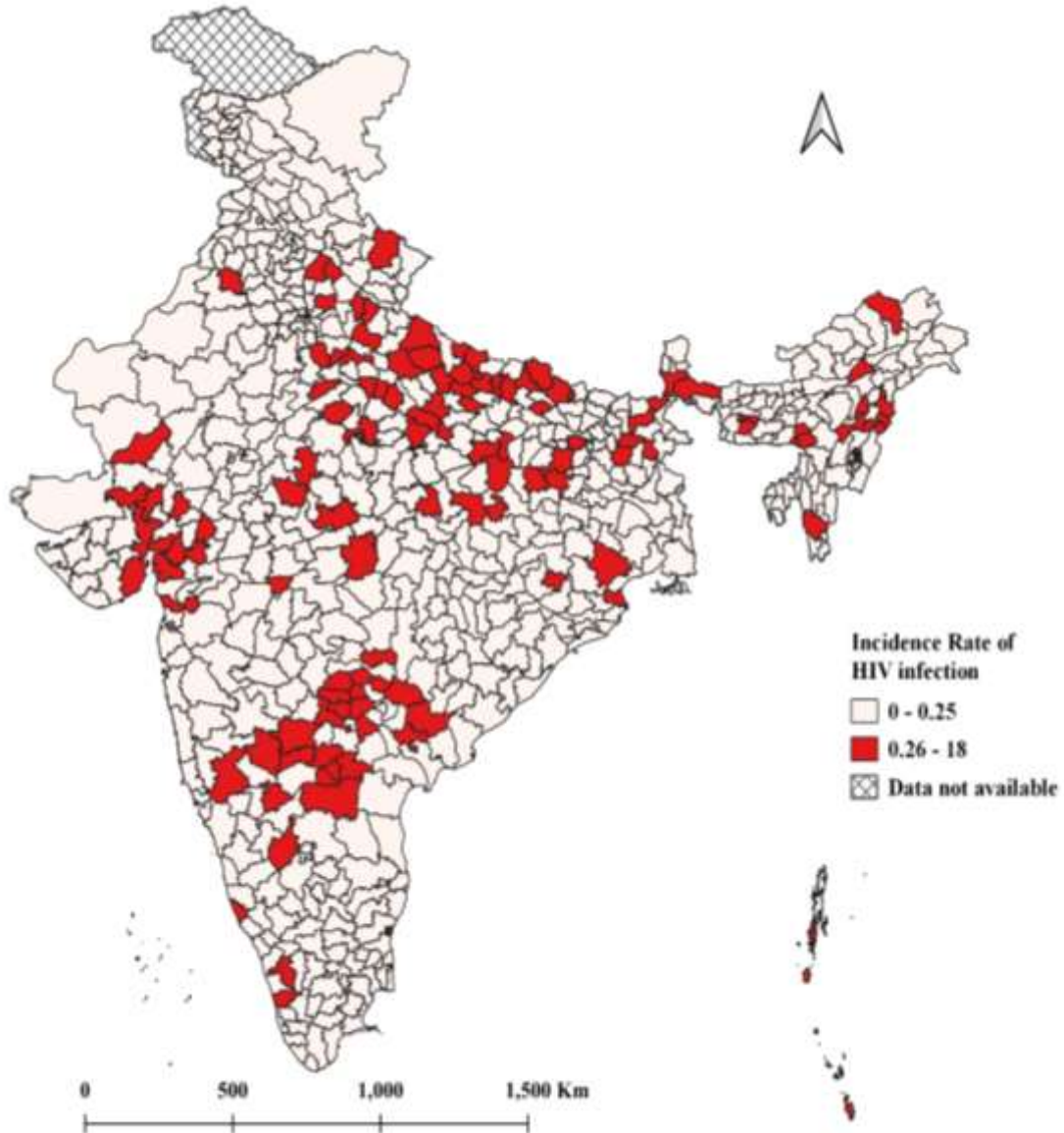
Map 1: State level incidence rate of HIV in India – 2018-19



It is estimated that the world may not achieve the target of ending HIV/AIDS completely because of the severe disruptions to HIV/AIDS services throughout the world during the COVID-19 pandemic (UNAIDS, 2020; Bekker et al., 2018;). Countries having a higher population with HIV pre-pandemic may fall further over the changes in priorities of providing health services with limited resources. A country like India which has the second largest population of HIV is at the edge of a staggering rise in the number

of persons with HIV (4,8). Evidence-based prioritization of health services with categorizing states and continuous surveillance in districts that are identified as high-priority districts may reduce the intensity of the colossal rise in HIV. In this context, our study found that the incidence of HIV varies within and between the states. The government may give priorities for HIV response and services required during the course.

Map 2: District level incidence rate of HIV in India



Source: Authors prepared districts level map using the HMIS data – 2018-19; the categorization of incidence is based on the national incidence rate (0.26%)

Annexure 1: Number of confirmed cases of HIV infection at ICTC Centers in India 2018-19			
State and Union Territories	Out of tested, confirmed with HIV infection at ICTC Centre	Total deaths reported due to HIV/AIDS	Total Tested
Andhra Pradesh	1574	91	1889522
Arunachal Pradesh	38	0	37900
Assam	826	3	601180
Bihar	13088	1	2134174
Chhattisgarh	505	8	926242
Goa	07	0	64166
Gujarat	12659	51	2318448
Haryana	802	14	928347
Himachal Pradesh	29	1	301203
Jammu & Kashmir	08	0	365393
Jharkhand	1835	2	982966
Karnataka	5996	1505	3437678

Kerala	1891	0	1141148
Madhya Pradesh	2062	14	1955459
Maharashtra	1050	113	4439593
Manipur	29	0	88533
Meghalaya	164	0	108063
Mizoram	123	0	57107
Nagaland	175	9	82031
Odisha	974	12	1216446
Punjab	352	40	1000203
Rajasthan	1109	12	2411910
Sikkim	01	0	17614
Tamil Nadu	380	47	3999323
Telangana	16941	40	1290620
Tripura	38	2	133330
Uttar Pradesh	37603	177	4020903
Uttarakhand	303	1	222864
West Bengal	1699	18	2565511
Union Territories			
Andaman & Nicobar Islands	127	0	27065
Chandigarh	22	4	120403
Dadra & Nagar Haveli	04	0	40064
Daman & Diu	318	0	13367
Delhi	1609	11	1015037
Lakshadweep	0	0	4560
Puducherry	16	0	109527
INDIA	104357	2176	40067900

ICTC - Integrated Counselling and Testing Centers

The past studies have evidence that the states with metropolitan cities and socioeconomically well-off reported a higher burden of HIV/AIDS (10–12). The key population in metropolitan cities including people who inject drugs, men who have sex with men, transgender people, female sex workers, inmates in central jails, migrants, and long-distance truckers are more prevalent in socioeconomically developed places (5,13–17). At the same time, migrants in these cities tend to be a carrier for transmission of infection to their origin places (5,16,18,19). In India, most of the metropolitan cities received migrants from the socioeconomically less developed states including Bihar, Uttar Pradesh, Jharkhand, Chhattisgarh, and Madhya Pradesh (19,20). These migrants seem to be a super spreader of infection in their origin places (10,16–19). Our study produces the findings that states including Telangana, Uttar Pradesh, Bihar, and Gujarat have a higher incidence of HIV compared to the other states in India. Previous studies also underlined the shift in the epidemic from socioeconomically developed states to less developed areas such as Uttar Pradesh, Bihar, Chhattisgarh, Mizoram, Tripura, and

West Bengal (Kumar et al. 2021, 2017; NACO 2020; The World Bank 2012). The study concludes that there is an urgent need to address the commoving and increasing trend in HIV incidence in these states before it causes a heavy burden of HIV. Particularly these states are densely populated with poor health services and less socioeconomic development. The government ought to revitalize programs that aim to improve the knowledge of HIV/AIDS, attitude, and safe practices of sexual activities among the susceptible population in society. The information, education, and communications programs on HIV should be strengthened over the period in states having a higher number of persons with HIV. As the decentralized response is considered a hallmark of the National AIDS control program in India, the district-level planning and monitoring of the programs may help to arrest the rising incidence in the socioeconomically poor states of India before it's too late.

Declaration by Authors

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

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How to cite this article: Praveen Kailash Chokhandre, Ragini Itagi, M S Kampli et.al. Identifying hotspots of HIV infection in India. *Int J Health Sci Res.* 2023; 13(6):93-99. DOI: <https://doi.org/10.52403/ijhsr.20230616>
